



National Aeronautics and
Space Administration

NASA Case No.: LAR 15816-1

DECLARATION, POWER OF ATTORNEY AND PETITION - ORIGINAL APPLICATION

As a below-named inventor, I hereby declare that: my residence, post office address and citizenship, are stated below next to my name, I believe I am the original, first and sole invention (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled
PIEZOELECTRIC MACRO-FIBER COMPOSITE ACTUATOR AND METHOD FOR MAKING SAME

the specification of which x is attached hereto, was filed on (Date)
as Application Serial No. and was amended on (Date) .

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Patent and Trademark Office all information which is known to me to be material to patentability as defined in 37 CFR §1.56.

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

 , , the status of which is patented, pending, abandoned.
(Serial No.) (Filing Date)

I hereby claim priority benefits under Title 35, United States Code §119(e) of any United States Provisional Applications listed below:

 , , the status of which is patented, pending, abandoned.
(Provisional Serial No.) (Filing Date)

POWER OF ATTORNEY: I hereby appoint the following attorney(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

<u>Linda B. B. Blackburn</u>	<u>Reg. No. 38,385</u>	<u>Robin W. Edwards</u>	<u>Reg. No. 39,179</u>
<u>Hillary W. Hawkins</u>	<u>Reg. No. 42,235</u>	<u>Kurt G. Hammerle</u>	<u>Reg. No. 36,819</u>
<u>Helen M. Galus</u>	<u>Reg. No. 40,615</u>	<u>Sue H. Palk</u>	<u>Reg. No. 36,422</u>
<u>Gary G. Borda</u>	<u>Reg. No. 35,455</u>	<u>Alan G. Kennedy</u>	<u>Reg. No. 28,625</u>
<u>Harry Lupuloff</u>	<u>Reg. No. 31,117</u>	<u>John G. Mannix</u>	<u>Reg. No. 27,254</u>

ADDRESS ALL CORRESPONDENCE TO:

Name: KURT G. HAMMERLE
Address: NASA Langley Research Center
3 Langley Boulevard
Mail Stop 212
Hampton, VA 23681-2199

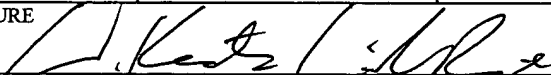
DIRECT TELEPHONE CALLS TO:


Name: KURT G. HAMMERLE
Telephone: (Set out complete number to be dialed
from USPTO):
757-864-2470
757-864-3522

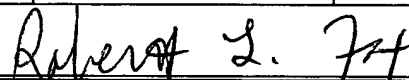
Further, as a named inventor, I certify that the Government of the United States of America, as represented by the Administrator of the National Aeronautics and Space Administration has x an assignment in, or a license to the invention set forth in this application and has an irrevocable right to prosecute this application and to receive the patent.

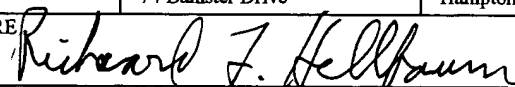
Wherefore, I pray that Letters Patent be granted to me for this invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification, claims, power of attorney and this petition.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001; and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR	LAST WILKIE	FIRST W.	MIDDLE OR INITIAL Keats
RESIDENCE AND CITIZENSHIP	CITY Williamsburg	STATE OR FOREIGN COUNTRY Virginia	COUNTRY OF CITIZENSHIP USA
POST OFFICE	STREET NO. AND NAME 376 Merrimac Trail, #411	CITY AND STATE (OR COUNTRY) Williamsburg, Virginia	ZIP CODE 23185
SIGNATURE 			DATE 10/27/99

FULL NAME OF INVENTOR	LAST BRYANT	FIRST Robert	MIDDLE OR INITIAL G.
RESIDENCE AND CITIZENSHIP	CITY Newport News	STATE OR FOREIGN COUNTRY Virginia	COUNTRY OF CITIZENSHIP USA
POST OFFICE	STREET NO. AND NAME 703 Whaler Drive	CITY AND STATE (OR COUNTRY) Newport News, Virginia	ZIP CODE 23602
SIGNATURE 			DATE 10-27-99

FULL NAME OF INVENTOR	LAST FOX	FIRST Robert	MIDDLE OR INITIAL L.
RESIDENCE AND CITIZENSHIP	CITY Hayes	STATE OR FOREIGN COUNTRY Virginia	COUNTRY OF CITIZENSHIP USA
POST OFFICE	STREET NO. AND NAME 1592 Fleming Road	CITY AND STATE (OR COUNTRY) Hayes, Virginia	ZIP CODE 23072
SIGNATURE 			DATE 10-27-99

FULL NAME OF INVENTOR	LAST HELLBAUM	FIRST Richard	MIDDLE OR INITIAL F.
RESIDENCE AND CITIZENSHIP	CITY Hampton	STATE OR FOREIGN COUNTRY Virginia	COUNTRY OF CITIZENSHIP USA
POST OFFICE	STREET NO. AND NAME 74 Banister Drive	CITY AND STATE (OR COUNTRY) Hampton, Virginia	ZIP CODE 23666
SIGNATURE 			DATE 10/29/99

Further, as a named inventor, I certify that the Government of the United States of America, as represented by the Administrator of the National Aeronautics and Space Administration has x an assignment in, or a license to the invention set forth in this application and has an irrevocable right to prosecute this application and to receive the patent.

Wherefore, I pray that Letters Patent be granted to me for this invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification, claims, power of attorney and this petition.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001; and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR	LAST HIGH	FIRST James	MIDDLE OR INITIAL W.
RESIDENCE AND CITIZENSHIP	CITY Norfolk	STATE OR FOREIGN COUNTRY Virginia	COUNTRY OF CITIZENSHIP USA
POST OFFICE	STREET NO. AND NAME 1116 W. Ocean View Avenue	CITY AND STATE (OR COUNTRY) Norfolk, Virginia	ZIP CODE 23503
SIGNATURE <i>James W. High</i>			DATE 10/27/99

FULL NAME OF INVENTOR	LAST JALINK	FIRST Antony	MIDDLE OR INITIAL (NMI) (Jr.)
RESIDENCE AND CITIZENSHIP	CITY Newport News	STATE OR FOREIGN COUNTRY Virginia	COUNTRY OF CITIZENSHIP USA
POST OFFICE	STREET NO. AND NAME 5 Madison Lane South	CITY AND STATE (OR COUNTRY) Newport News, Virginia	ZIP CODE 23606
SIGNATURE <i>Antony Jalink Jr.</i>			DATE 10/29/99

FULL NAME OF INVENTOR	LAST LITTLE	FIRST Bruce	MIDDLE OR INITIAL D.
RESIDENCE AND CITIZENSHIP	CITY Gloucester	STATE OR FOREIGN COUNTRY Virginia	COUNTRY OF CITIZENSHIP USA
POST OFFICE	STREET NO. AND NAME <i>6000 Piney Point Drive</i> <i>5926 Forest Grove Drive</i>	CITY AND STATE (OR COUNTRY) Gloucester, Virginia <i>Yorktown, VA</i>	ZIP CODE <i>23061-23692</i>
SIGNATURE <i>Bruce D. Little</i>			DATE 10/28/99

FULL NAME OF INVENTOR	LAST MIRICK	FIRST Paul	MIDDLE OR INITIAL H.
RESIDENCE AND CITIZENSHIP	CITY Grafton	STATE OR FOREIGN COUNTRY Virginia	COUNTRY OF CITIZENSHIP USA
POST OFFICE	STREET NO. AND NAME 201 Illex Drive	CITY AND STATE (OR COUNTRY) Grafton, Virginia	ZIP CODE 23692
SIGNATURE <i>Paul H. Mirick</i>			DATE 10/28/99

Mail Stop Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

**COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING
NEW PATENT APPLICATION (37 C.F.R. § 3.31)**

**IDENTIFICATION OF APPLICATION
(37 C.F.R. § 3.21 and 37 C.F.R. § 3.31(a)(4))**

1. The patent application filed herewith and, to which the attached assignment (document) refers, is identified as follows:
 - a. Type of application: Application of patent (37 C.F.R. § 1.53(b))
 - b. Date of execution: September 3, 2003
 - c. Name of each inventor:
 - 1: W. Keats Wilkie
 - 2: Robert G. Bryant
 - 3: Robert L. Fox
 - 4: Richard F. Hellbaum
 - 5: James W. High
 - 6: Antony Jalink, Jr.
 - 7: Bruce D. Little
 - 8: Paul H. Mirick
 - d. Title of invention: Piezoelectric Composite Apparatus and a Method for Fabricating the Same

NAME OF PARTY(IES) CONVEYING INTEREST (37 C.F.R. § 3.31(a)(1))

2. The parties conveying this interest are:

Name 1: W. Keats Wilkie
Name 2: Robert G. Bryant
Name 3: Robert L. Fox
Name 4: Richard F. Hellbaum
Name 5: James W. High
Name 6: Antony Jalink, Jr.
Name 7: Bruce D. Little
Name 8: Paul H. Mirick

**NAME AND ADDRESS OF PARTY(IES) RECEIVING INTEREST
(37 C.F.R. § 3.31(a)(2))**

3. The rights are being conveyed to:

United States of America as represented by the Administrator of the National Aeronautics
and Space Administration
Washington, D.C. 20546

**DESCRIPTION OF INTEREST CONVEYED OR TRANSACTION RECORDED
(37 C.F.R. § 3.31 (a)(3))**

4. The accompanying document intends to accomplish:

an assignment.

**NAME AND ADDRESS OF PARTY TO WHOM CORRESPONDENCE
SHOULD BE MAILED (37 C.F.R. § 3.31(a)(5))**

5. Please address correspondence to:

NASA Langley Research Center
Mail Stop 212
3 Langley Boulevard
Hampton VA 23681-2199
757-864-2470

DATE ASSIGNMENT (DOCUMENT) EXECUTED (37 C.F.R. § 3.31(a)(7))

6. The attached assignment (document) was executed on:

W. Keats Wilkie	10/27/1999
Robert G. Bryant	10/27/1999
Robert L. Fox	10/27/1999
Richard F. Hellbaum	10/29/1999
James W. High	10/27/1999
Antony Jalink, Jr.	10/29/1999
Bruce D. Little	10/28/1999
Paul H. Mirick	10/28/1999

LANGUAGE OF ASSIGNMENT (DOCUMENT) TO BE RECORDED

7. The attached document is in the English language.

ORIGINAL DOCUMENT OR TRUE COPY SUBMITTED

8. Submitted herewith is a true copy of the original document.

**NUMBER OF APPLICATIONS IDENTIFIED IN THIS COVER SHEET
AND THE FEE**

9. A. This cover sheet identifies only one application.
B. The fee for recordal (37 C.F.R. § 1.21(h)) is \$40.00.

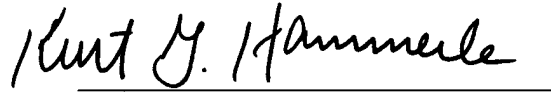
Authorization is hereby made to charge the amount of \$40.00 to Deposit Account No. 14-0116.

Charge any additional fees required by this paper or credit any overpayment in the manner authorized above.

A duplicate of this paper is attached.

**STATEMENT (37 C.F.R. § 3.31(a)(9))
AND SIGNATURE (37 C.F.R. § 3.31(a)(10))**

10. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.



Kurt G. Hammerle
Registration No. 36,819
NASA Langley Research Center
Mail Stop 212
3 Langley Boulevard
Hampton, VA 23681-2199
757-864-2470
Customer No. 23351

TOTAL NUMBER OF PAGES BEING SUBMITTED

11. The total number of pages being submitted, including cover sheet, attachment(s), and document(s) is: 5



Patent Application

ASSIGNMENT AND AGREEMENT

National Aeronautics and
Space Administration

Title of Invention: PIEZOELECTRIC MACRO-FIBER COMPOSITE ACTUATOR AND METHOD
FOR MAKING SAME

Inventor(s): W. KEATS WILKIE, ROBERT G. BRYANT, ROBERT L. FOX, RICHARD F.
HELLBAUM, JAMES W. HIGH, ANTONY JALINK, JR., BRUCE D. LITTLE, PAUL H. MIRICK

NASA Case No.: 15816-1 Application No. *: _____ Filing Date*: _____

WHEREAS, the parties to this Assignment and Agreement are the undersigned inventor(s) and the United States Government (hereafter Government), as represented by the Administrator of the National Aeronautics and Space Administration;

WHEREAS, the making of this Assignment and Agreement is in accordance with 37 CFR Part 501; and

WHEREAS, the undersigned inventor(s) has (have) executed, on the date(s) indicated below, an application for a United States Patent on the above-entitled invention.

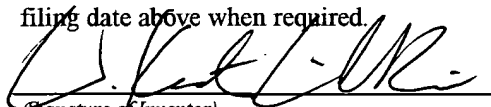
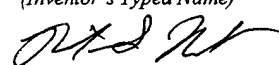
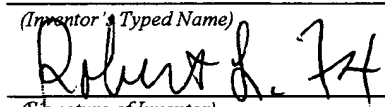
NOW THEREFORE, in consideration of employment by the Government, the undersigned hereby:

1. Assign to the Government my (our) full and exclusive right in and to said invention within the United States of America, its territories and possessions, and my (our) entire right, title and interest in and to said application, and any corresponding continuation or divisional application(s), and any patent(s) that may issue therefrom.

2. Agree to grant to the Government my (our) full and exclusive foreign rights in and to said invention, in accordance with 37 CFR 501.9(d), including rights of priority under the International Convention of Paris (1883), as amended. If the Government chooses not to file an application in any foreign country, I (we) may request rights in that country, in accordance with 37 CFR 501.9(d), and such rights will be subject to the reservation to the Government of a nonexclusive, irrevocable, royalty-free license in the invention with power to grant licenses for all governmental purposes. The terms of such reservation will appear, where practicable, in any foreign patent which may issue on such invention.

3. Agree, at the expense of the Government, (a) to execute any document for, (b) to deliver any requested information to, and (c) to cooperate in any manner with the Government in order to allow the Government to protect any interest transferred by this Assignment and Agreement.

*4. Authorize and request the attorneys of record in the application to insert the application number and filing date above when required.

 (Signature of Inventor) <u>W. KEATS WILKIE</u> (Inventor's Typed Name)	<u>10/27/99</u> (Date)	<u>10/27/99</u> (Date Application Executed)
	<u>376 Merimac Trail, #411, Williamsburg, VA 23185, U.S.</u> (Post Office Address - Including Country)	
 (Signature of Inventor) <u>ROBERT G. BRYANT</u> (Inventor's Typed Name)	<u>10-27-99</u> (Date)	<u>10-27-99</u> (Date Application Executed)
	<u>703 Whaler Drive, Newport News, VA 23602, U.S.</u> (Post Office Address - Including Country)	
 (Signature of Inventor) <u>ROBERT L. FOX</u> (Inventor's Typed Name)	<u>10-27-99</u> (Date)	<u>10-27-99</u> (Date Application Executed)
	<u>1592 Fleming Road, Hays, VA 23072, U.S.</u> (Post Office Address - Including Country)	



ASSIGNMENT AND AGREEMENT

National Aeronautics and
Space AdministrationTitle of Invention: PIEZOELECTRIC MACRO-FIBER COMPOSITE ACTUATOR AND
METHOD FOR MAKING SAMEInventor(s): W. KEATS WILKIE, ROBERT G. BRYANT, ROBERT L. FOX, RICHARD F.
HELLBAUM, JAMES W. HIGH, ANTONY JALINK, JR., BRUCE D. LITTLE, PAUL H. MIRICKNASA Case No.: 15816-1 Application No.*: _____ Filing Date*: _____

WHEREAS, the parties to this Assignment and Agreement are the undersigned inventor(s) and the United States Government (hereafter Government), as represented by the Administrator of the National Aeronautics and Space Administration;

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3. Agree, at the expense of the Government, (a) to execute any document for, (b) to deliver any requested information to, and (c) to cooperate in any manner with the Government in order to allow the Government to protect any interest transferred by this Assignment and Agreement.

*4. Authorize and request the attorneys of record in the application to insert the application number and filing date above when required.

(Signature of Inventor)

RICHARD F. HELLBAUM

(Inventor's Typed Name)

(Date)

(Date Application Executed)

75 Banister Drive, Hampton, VA 23666, U.S.

(Post Office Address - Including Country)

(Signature of Inventor)

JAMES W. HIGH

(Inventor's Typed Name)

(Date)

(Date Application Executed)

1116 W. Ocean View Avenue, Norfolk, VA 23503, U.S.

(Post Office Address - Including Country)

(Signature of Inventor)

ANTONY JALINK, JR.

(Inventor's Typed Name)

(Date)

(Date Application Executed)

5 Madison Lane South, Newport News, VA 23606, U.S.

(Post Office Address - Including Country)



Patent Application

ASSIGNMENT AND AGREEMENT

National Aeronautics and
Space Administration

Title of Invention: PIEZOELECTRIC MACRO-FIBER COMPOSITE ACTUATOR AND
METHOD FOR MAKING SAME

Inventor(s): W. KEATS WILKIE, ROBERT G. BRYANT, ROBERT L. FOX, RICHARD F.
HELLBAUM, JAMES W. HIGH, ANTONY JALINK, JR., BRUCE D. LITTLE, PAUL H. MIRICK

NASA Case No.: 15816-1 Application No.*: _____ Filing Date*: _____

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WHEREAS, the undersigned inventor(s) has (have) executed, on the date(s) indicated below, an application for a United States Patent on the above-entitled invention.

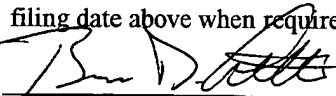
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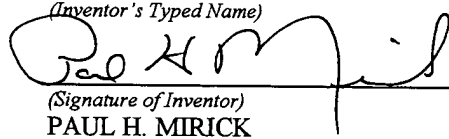
3. Agree, at the expense of the Government, (a) to execute any document for, (b) to deliver any requested information to, and (c) to cooperate in any manner with the Government in order to allow the Government to protect any interest transferred by this Assignment and Agreement.

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(Signature of Inventor)
BRUCE D. LITTLE
(Inventor's Typed Name)

10/28/99 10/28/99
(Date) (Date Application Executed)
603 Piney Point Rd, Yorktown, VA 23061
9926 Forest Grove Drive, Gloucester, VA 23061, U.S.
(Post Office Address - Including Country)

732
10/28/99


(Signature of Inventor)
PAUL H. MIRICK
(Inventor's Typed Name)

10/28/99 10/28/99
(Date) (Date Application Executed)
201 Ilex Drive, Grafton, VA 23692, U.S.
(Post Office Address - Including Country)

(Signature of Inventor)

(Date)

(Date Application Executed)

(Inventor's Typed Name)

(Post Office Address - Including Country)